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COMPLETE SPECIFICATION.



Improved Manufacture of Starch Preparations for Producing Adhesives.

We, HENKEL & CIE. G.M.B.H., a German Company, of Heyestrasse 67, Düsseldorf-Holthausen, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It has been found that disintegrated starch preparations which produce excellent adhesives with cold water are obtained if mixtures of potato starch with morphologically different starches or starch-containing substances, such as cereal flours, which mixtures contain only so much water that they are not pasty, are subjected to a heat treatment known per se between heated surfaces.

In this way dried adhesives of the highest perfection may be obtained by the simultaneous disintegration of the, morphologically, substantially different kinds of starch and cereal flour.

For example, any mixtures with potato starch of starches, such as rice starch, maize starch, wheat starch, or of cereal flour, such as rye flour, wheat flour, maize flour, rice flour and the like may be employed, according to the type of dried adhesive required. Whereas dried adhesives which are made only from one kind of starch frequently suffer from certain disadvantages, such as for example low power of adhesion, difficulty in spreading dragging propensity, etc., it is possible according to the invention by the simultaneous disintegration of potato starch with different kinds of starch to obtain dried adhesives which substantially possess only the advantageous properties of the disintegrated starch preparations corresponding to the individual starting substances.

In carrying out the present invention, mixtures of potato starch with different kinds of starch or cereal flour are subjected to a heat treatment known per se between heated surfaces. The proportion between the components of the mixture employed is so selected that each component perceptibly influences the properties of the mixture. Care must be taken

that the mixtures possess only such a moisture content that they are not pasty.

In the conversion of the mixtures into the disintegrated form, other different chemicals known per se, which impart certain properties to the adhesives obtainable from the dried substances, may be added.

Thus, for example, substances which are acid or alkaline or which give off oxygen may be added to facilitate the disintegration and also to effect a more or less considerable breaking down of the starch. Soaps or other wetting agents may be added in the manner known per se.

In the treatment between the heated surfaces, the dried adhesives are obtained in the form of cakes which are comminuted in known manner. Thus, for example, these cakes may be comminuted to form coarse-grained products without producing dust, for example between cylinders which are provided with knives arranged in different directions or in sieving machines having a cutting action, the resulting products having the property of swelling up in cold water without the formation of lumps. Substances known per se which regulate the rate of swelling, such as borax and the like, may be added to the dried adhesives, before, during or after their manufacture.

It is already known to mix disintegrated starches with ordinary, that is to say non-disintegrated, starch, for the manufacture of adhesives, and also to manufacture adhesives from ordinary flours, disintegrated flours or disintegrated starch, the treatment of these substances between heated surfaces having also been proposed previously. It was, however, still new and unexpected to disintegrate mixtures of potato starch with different starches or other starch-containing substances, such as cereal flours, between heated surfaces. Heretofore, the opinion was that in the case of such mixtures of structures differing substantially from each other morphologically, the disintegration would proceed unevenly, so that useless products would be obtained. By the simultaneous disintegration of differ-

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ent kinds of starch, however, dried adhesives may be obtained possessing substantially only the advantageous properties of the disintegrated starch preparations corresponding to the starting substances.

EXAMPLES.

1. 100 kilograms of pure potato starch are mixed with 50 kilograms of maize flour. Water is added to the mixture in a quantity such that the latter contains 24 per cent. moisture. The mixture is thereupon passed between two cylinders heated to 180° to 225° C. The cakes obtained are comminuted. In this way, there is obtained an excellent dried adhesive which swells with cold water to form an excellent wall-paper paste.

2. 200 kilograms of potato starch are mixed with 115 kilograms of rye flour and are treated as described in Example 1. A dried adhesive is obtained which can be mixed with cold water to form a smooth paste of excellent spreading and adhesive properties.

3. 350 kilograms of potato starch are mixed with 350 kilograms of wheat flour or wheat starch. Water is added in such a quantity to this mixture that the latter contains about 25 per cent. moisture. The mixture is then passed between two cylinders heated to 180—220° C. The cakes obtained are pulverized. In this way, a dry adhesive is obtained, which swells with cold water to form an excellent paste.

4. 600 kilograms of potato starch are mixed with 600 kilograms of rye flour.

The mixture is treated as described in Example 3. A dry adhesive is obtained, which, even on treatment with cold water, swells to form an excellent paste. If desired, the spreading power of the end product stirred with cold water can be increased by adding hydrogen peroxide to the initial mixture.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A process for improving dry adhesives made from potato starch by the hydrolysis of starch and starch containing materials, characterised in that mixtures of potato starch with morphologically different starches or starch-containing substances, such as cereal flours are made; the said mixtures containing only sufficient water that they are not pasty, and in that the said mixtures are subjected to a heat treatment known per se between heated surfaces.

2. The process for the manufacture of dried adhesives substantially as described.

3. Dried adhesives when manufactured by the process particularly described and ascertained.

Dated this 1st day of November, 1933.

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